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Preliminary Description of Dental Morphology in South American Titi Monkeys, Genus *Callicebus*

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As for the taxonomy of species of the genus *Callicebus*, many authors follow the classification given by HERSHKOVITZ (1963) dividing into three distinct species, namely, *C. personatus*, *C. torquatus* and *C. moloch*. However the sample size of *C. personatus* he used is so small that he did not include this species in his taxonomic review. Since then, no thorough taxonomic works of *Callicebus* have been undertaken. Especially any attempt from the view point of dental morphology has never been done. NEWELL-MORRIS and WIENKER (1986) showed dermatoglyphic pattern of the three species but they only referred to the relative relationship of them. Therefore it is not sufficient for definitive classification.

Tooth morphology of three species is compared and analysed. The numbers of samples used are shown in Table 1. As genus *Callicebus* has no sex difference (KINZEY, 1972; NEWELL-MORRIS and WIENKER, 1986), samples of both sexes were dealt with together. Most of morphological differences of the three species appear in upper teeth, especially first and

Table 1. Sample size in each species

	Museu Nacional (RIO)	Museu de Zoologico (SAO)	Museu Emilio Goeldi (BELEM)	JMC & KUPRI (JAPAN)	Total
<i>Callicebus personatus</i>	21	4	0	0	25
<i>Callicebus torquatus</i>	10	3	4	7*	24
<i>Callicebus moloch</i>	16	0	4	45**	65

* collected by K. Wada and T. Watanabe
** mainly collected by M. Minezawa and M. Natori

Table 2. Identical tooth characters of genus *Callicebus*.

UPPER		PERSONATUS	TORQUATUS	MOLOCH
I ¹	Lingual tubercle	1	3	2
P ² ~ P ⁴	Hypocone	3	1	2
	Lingual cingulum	3	1	2
M ¹ ~ M ²	Metaloph	1	3	2
	Paraconule	3	1	2
	Lingual cingulum	3	1	2
	Buccal cingulum	3	1	2
	Stylarcusps	3	1	2
LOWER		PERSONATUS	TORQUATUS	MOLOCH
P ² ~ M ²	Lingual cingulum	3	1	2

		high	middle	low
rate of appearance	:	3	2	1
degree of development	:	3	2	1

Table 3. Appear frequency of metaconule and paraconule

METACONULE						PARACONULE					
personatus		torquatus		moloch		personatus		torquatus		moloch	
M1	M2	M1	M2	M1	M2	M1	M2	M1	M2	M1	M2
0.846	0.615	0	0	0.333	0.324	0.462	0.385	0.111	0	0.055	0.872

Table 4. Mean of the number of stylarcusps in each tooth

personatus		torquatus		moloch	
M1	M2	M1	M2	M1	M2
3.31	1.46	0.60	0.20	1.00	0.21

second molars, and there are few differences in lower dentition (Table 2). In upper molars, the differences are seen in the morphology of the mainly metaloph, metaconule, paraconule, lingual cingulum, buccal cingulum and stylarcusps. NATORI (1983) classified the upper molars of *Saimiri* in relation to the height between metaloph and prehypocrista (Figure 1). In *Callicebus*, there are the same morphological tendencies, especially in upper molars. Figure 2 shows degree of each type in three species. Strong tendency of degenerating in metaloph of *C. personatus* is observed. Extreme samples of *C. personatus* degenerate the lingua and buccal part of metaloph and it becomes to form a independent cusp.

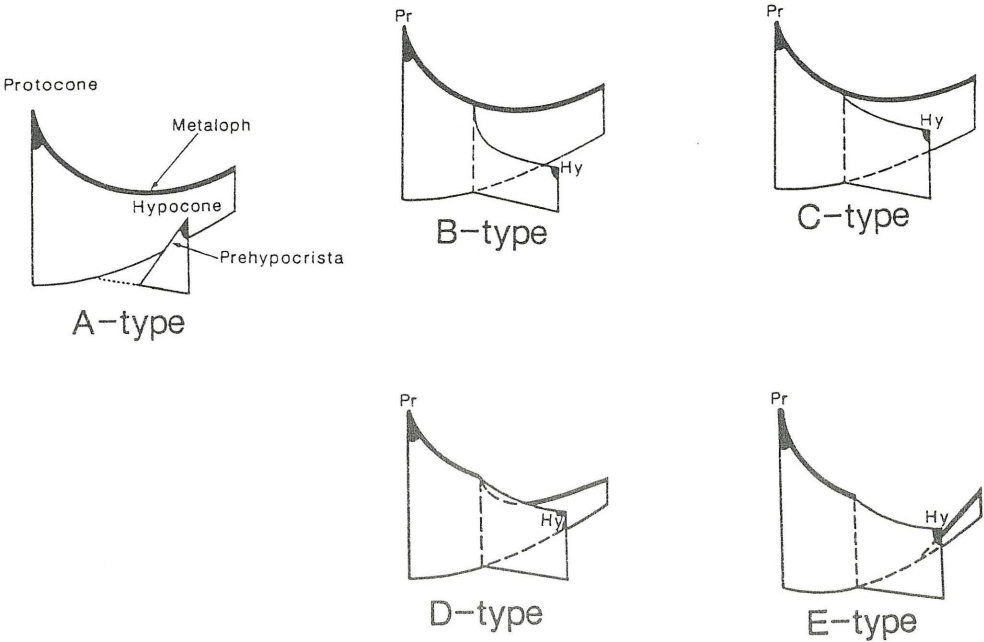


Figure 1. Classification of relative height between metaloph and prehypocrista, modified NATORI (1984).

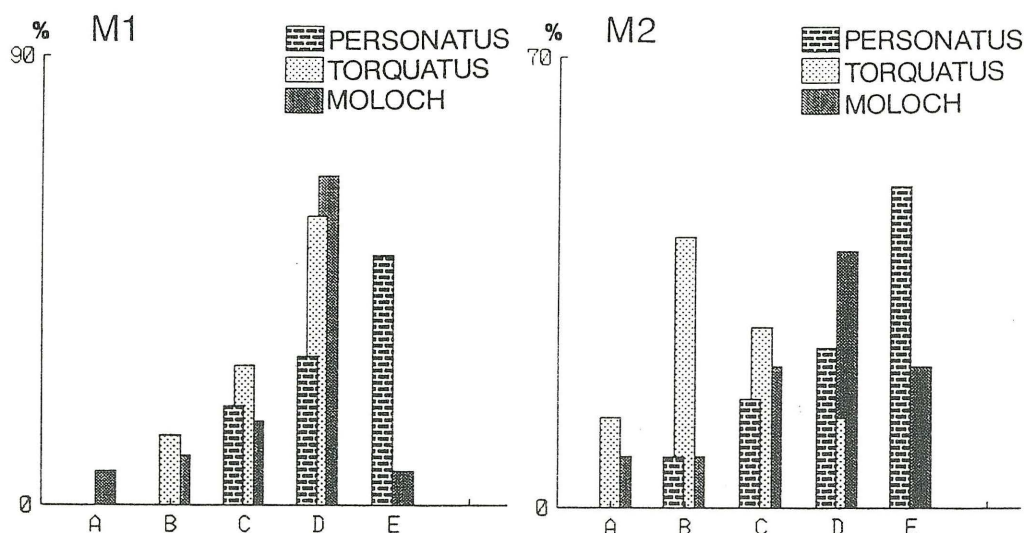


Figure 2. Histogram of the three species in each type

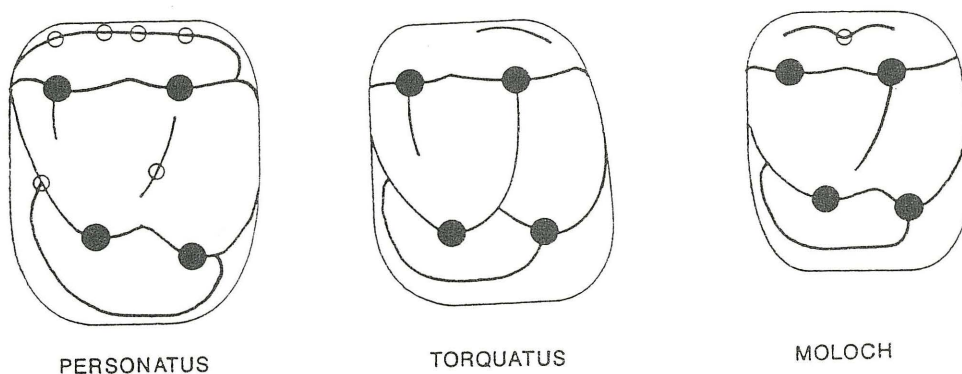


Figure 3. Occlusal view of typical upper left first molar in each species

The frequency of appearance of metaconule, a projection on the middle part of metaloph, and paraconule, a projection to form a junction between preprotocrista and the edge of lingual cingulum, differs among the three species (Table 3). Both metaconule and paraconule appear most frequently in *C. personatus*. There is low rate of them in *C. torquatus*. The appearance rate of paraconule in *C. moloch* is low, too. But metaconule has relatively high rate appearance than paraconule.

Cingulum, of both buccal and lingual, is well-developed in *C. personatus* and *C. moloch* follows this. *C. torquatus* has least developed cingulum among the three species, especially buccal cingulum is not well developed. Some of *C. personatus* have distinctive cingulum that reaches to distal part of hypocone.

The stylarcusps that is on the edge of buccal cingulum appears to *C. personatus* in general. It

is very rare in *C. torquatus*, especially in upper second molar. The mean numbers of stylarcusps are shown in Table 4.

Typical form of upper first molars in each species is shown in Figure 3. By this study, it is now clear that it is possible to identify these three species based solely on the dental characters.

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